



United States  
Department of  
Agriculture

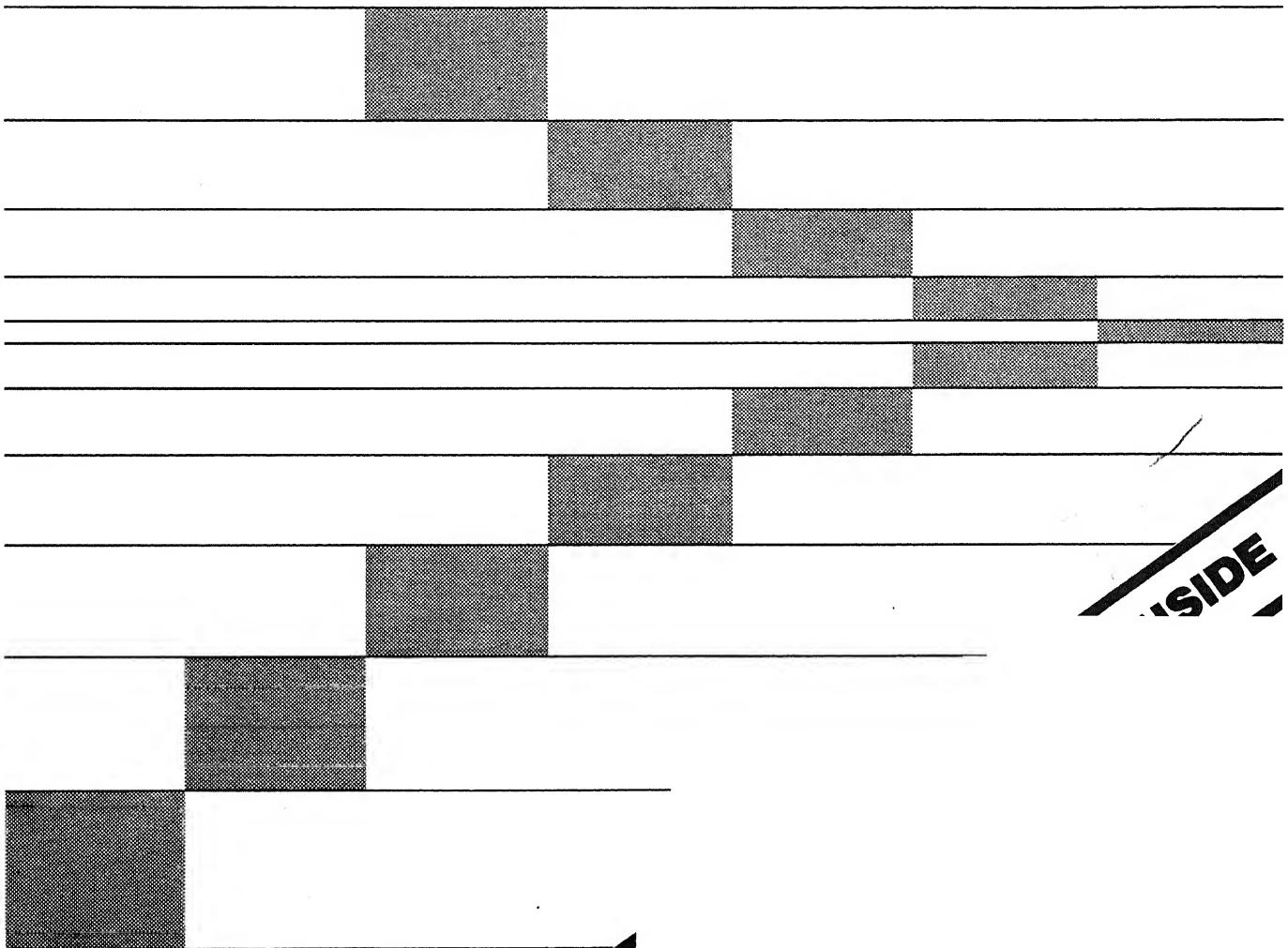
Forest Service

North Central  
Experiment Station



# New from North Central Publications

August 1988-April 1989



INSIDE

NOTE N

## **1. Research Note NC-346.**

Haines, Donald A.; Frost, John S. 1988. Fire-weather stations in the northeastern United States. Res. Note NC-346. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 3 p.

Presents northeastern locations of instrumented fire-weather stations that record data necessary for input into the National Fire-Danger Rating System.

## **2. Resource Bulletin NC-104.**

Hansen, Mark H.; Golitz, Mark F. 1988. Timber resource of the Indiana Knobs Unit, 1986. Resour. Bull. NC-104. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 92 p.

The third inventory of Indiana's timber resource shows that commercial forest area in the Knobs Unit decreased less than 2 percent between 1967 and 1986, from 1,769 to 1,741 thousand acres. During the same period growing-stock volume increased 33 percent. Highlights and statistics are presented on area, volume, growth, mortality, and removals.

## **3. Resource Bulletin NC-105.**

Raile, Gerhard K.; Leatherberry, Earl C. 1988. Illinois' forest resource. Resour. Bull. NC-105. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 113 p.

The third inventory of timber resources in Illinois shows a 1.2 percent increase in timberland and a 40.5 percent gain in growing-stock volume between 1962 and 1985. Text and statistics are presented on area, volume, growth, mortality, removals, utilization, biomass, and future timber supply.

## **4. Resource Bulletin NC-107.**

Spencer, John S., Jr.; Smith, W. Brad; Hahn, Jerold T.; Raile, Gerhard K. 1988. Wisconsin's fourth forest inventory, 1983.

Resour. Bull. NC-107. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 158 p.

The fourth inventory of the timber resource of Wisconsin shows that growing-stock volume increased from 11.2 to 15.5 billion cubic feet between 1968 and 1983, and area of timberland increased from 14.5 to 14.8 million acres. Presented are analysis and statistics on forest area and timber volume, growth, mortality, removals, and projections.

## **5. Resource Bulletin NC-109.**

Blyth, James E.; Weatherspoon, Anthony K.; Smith, W. Brad. 1988. Michigan timber industry—an assessment of timber product output and use. Resour. Bull. NC-109. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 55 p.

Discusses recent Michigan forest industry trends; production and receipts of pulpwood, saw logs, and veneer logs; and production of other timber products in 1984. Reports on logging residue, on wood and bark residue generated at primary wood-using mills, and on disposition of this mill residue.

## **6. Research Paper NC-283.**

Balogh, James C.; Grigal, David F. 1988. Tall shrub dynamics in northern Minnesota aspen and conifer forests. Res. Pap. NC-283. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 15 p.

Tall shrub dynamics were examined in upland stands in northern Minnesota. Mortality rates of shrub stems did not differ among the stands. Shrub stem regeneration did differ among the stands and was related to overstory characteristics, soil moisture, and soil nutrients. Stem density was regulated by annual regeneration.

## **7. Research Paper NC-284.**

Rose, Dietmar W.; Blinn, Charles R.; Brand, Gary J. 1988. A guide to forestry investment analysis. Res. Pap. NC-284.

St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 23 p.

It is often necessary to choose between several forestry projects. This paper provides the background needed to evaluate projects from a financial perspective. The basic steps for preparing a project analysis, suggestions for dealing with uncertainty, and techniques for monitoring a project are presented.

## **8. General Technical Report NC-119.**

Walters, Nancy R. 1988. Central States forest management guides as applied in STEMS. Gen. Tech. Rep. NC-119. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 22 p.

Describes a management prescription system for Central States cover types developed for use in the Central States Stand and Tree Evaluation and Modeling System (STEMS). It includes one management guide for each of the six major cover types in the region. Each guide consists of a decision key that prescribes management, based on stand characteristics and a set of marking rules that carries out the prescription. This management component can be used within STEMS or apart from it as a guide to making silvicultural decisions in the Central States.

## **9. General Technical Report NC-123.**

Blinn, Charles R.; Rose, Dietmar W.; Belli, Monique L. 1988. Guide to analyzing investment options using TWIGS. Gen. Tech. Rep. NC-123. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 15 p.

Describes methods for analyzing economic return of simulated stand management alternatives in TWIGS. Defines and discusses net present value, equivalent annual income, soil expectation value, and real vs. nominal analyses. Discusses risk and sensitivity analysis when comparing alternatives.

## **10. General Technical Report NC-124.**

Baumgartner, David C.; Marty, Robert J. 1988. Evaluation of resources at risk from wildland fires. Gen. Tech. Rep. NC-124. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 12 p.

Shows how existing information can be used to draw inferences about the distribution of values at risk from wildfire in Michigan, using example counties from the northern Lower Peninsula.

## **11. General Technical Report NC-126.**

Hodges, Donald G.; Jakes, Pamela J.; Cubbage, Frederick W. 1988. The status of forest management research in the United States. Gen. Tech. Rep. NC-126. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 16 p.

In 1985, the USDA Forest Service invested nearly \$30 million in forest management research, forest industry invested \$19 million, and universities invested at least \$17 million. Investments in this research have been declining since then. Forest Service data indicate that the public sector is the largest beneficiary of forest management research.

## **12. General Technical Report NC-129.**

Rouse, Cary. 1988. Fire in eastern forests. red - - -

### **13. General Technical Report NC-130.**

Smith, W. Brad; Hahn, Jerold T. 1989. Wisconsin's forest statistics, 1987: an inventory update. Gen. Tech. Rep. NC-130. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 48 p.

The Wisconsin 1987 inventory update, derived by using tree growth models, reports 14.7 million acres of timberland, a decline of less than 1 percent since 1983. This bulletin presents findings from the inventory update in tables detailing timberland area, volume, and biomass.

The following NC publication is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. The price is \$9.00. Be sure to include: **Stock Number 001-001-00634-3.**

### **Miscellaneous.**

U.S. Department of Agriculture, Forest Service. Burde, E. Lucy, ed. 1988. Walnut Notes. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. (A collection of 31 loose-leaf notes with varied pages and note numbers.)

A practical management guide for field foresters written in a nontechnical style and compiled in a loose-leaf format.

### **Recently reprinted and available!**

#### **14. How-To 17.**

Skilling, Darroll D. Rev. 1985. How to identify and control *Rhizosphaera* needlecast. St. Paul, MN: U.S. Department of Agriculture, Forest Service. 4 p.

#### **15. How-To 19.**

Ostry, Michael E.; Nicholls, Thomas H. 1976. How to identify eastern dwarf mistletoe on black spruce. St. Paul, MN: U.S. Department of Agriculture Forest Service. 6 p.

#### **16. How-To 30.**

Kessler, Kenneth J., Jr. 1978. How to control sapstreak disease of sugar maple. U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 6 p.

#### **17. How-To 33.**

Schipper, Arthur L., Jr.; Widin, Katharine D.; Anderson, Robert L. 1978. How to identify leaf rust of poplar and larch. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 6 p.

## NOTICE

The following is a list of our articles that appear in various Journals, etc. We do NOT have any in stock at this time. You may check with your local college or forestry library or appropriate Journal for a copy of the article.

Barten, Paul Kevin.

1988. Modeling streamflow from headwater catchments in the northern Lake States. St. Paul, MN: University of Minnesota. 305 p. Thesis.

[Bengston, David N.]

1987. What are the benefits from public sector forestry research? In: Public research in agriculture, forestry and home economics: its role, its benefits, and selected issues. IR-6 Inf. Rep. 87-3. St. Paul, MN: University of Minnesota, Department of Agricultural and Applied Economics: 36-39.

Bengston, David N.; Kaiser, H. Fred.

1988. Research planning and evaluation in the U.S. Forest Service: current practice and options for improvement. *Evaluation Review*. 12(3): 276-290.

Bengston, David N.; Gregersen, Hans M.; Haygreen, John.

1988. Seesawing across the forty-ninth parallel: the international diffusion of a wood-based technology. *Journal of Forest History*. 32(2): 82-88.

Bengston, David N.; Gregersen, Hans M.; Lundgren, Allen L.; Hamilton, Lawrence S.

1988. Forestry research capacity in the Asia-Pacific region. *Occas. Pap.* 6. Honolulu, HI: Environment and Policy Institute, East-West Center. 96 p.

Bradley, Dennis P.

1987. Wood energy potentials in northeastern Minnesota. In: Bradley, Dennis P.; Lothner, David C., comps. Achieving wood energy potentials: evidence in northeastern Minnesota. Gen. Tech. Rep. NC-114. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station: 1-5.

Bradley, Dennis P.; Gephart, John S.

1987. Estimating wood energy demand in northeastern Minnesota. In: Bradley, Dennis P.; Lothner, David C., comps. Achieving wood energy potentials: evidence in northeastern Minnesota. Gen. Tech. Rep. NC-114. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station: 44-59.

Bradley, Dennis P.; Lothner, David C., comps.

1987. Achieving wood energy potentials: evidence in northeastern Minnesota. Gen. Tech. Rep. NC-114. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 82 p.

Ceulemans, Reinhart; Hinckley, T.M.; Isebrands, J.G.; Stettler, R.F.; Wiard, B.M.

1988. Leaf orientation and net photosynthesis of different *Populus* clones. Supplement to *Plant Physiology* 86(4): 71. Abstract 424.

Chapman, Richard C.; Hamerly, Michael E.; Mech, L. David.

1985. A microcomputer-based capture collar. In: Weeks, Richard W.; Long, Francis M., co-eds. *Proceedings, 5th International conference on wildlife biotelemetry*; [1985 September 30]; [Chicago], [IL]. [Chicago], [IL]: International Conference on Wildlife Biotelemetry: 78-84.

Cole, David N.; Marion, Jeffrey L.

1988. Recreation impacts in some riparian forests of the eastern United States. *Environmental Management*. 12(1): 99-107.

Crow, T.R.

1988. Reproductive mode and mer self-replacement of northern red oak (*Quercus rubra*) - a review. *Forest Science*.

Dwyer, John F.  
1987. Predicting daily use of an urban forest recreation site. In: Hiebert, Ronald D.; Wood, James D., Jr., eds. Proceedings of the 1st Indiana Dunes Research conference: symposium on visitor aspects of resource management; 1986 May 1-3; Gary, IN. Atlanta, GA: U.S. Department of Interior, National Park Service, Scientific Publication Office: 20-33.

Ek, Alan R.; Hoganson, Howard M.; Hahn, Jerold T.  
1987. Predicting multiproduct timber yield for long-term supply analyses. In: Bradley, Dennis P.; Lothner, David C., comps. Achieving wood energy potentials: evidence in northeastern Minnesota. Gen. Tech. Rep. NC-114. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station: 6-12.

Ellefson, Paul V.; Wheatcraft, Andrew M.; Bradley, Dennis P.  
1987. Policy options to encourage wood energy use in northern Minnesota. In: Bradley, Dennis P.; Lothner, David C., comps. Achieving wood energy potentials: evidence in northeastern Minnesota. Gen. Tech. Rep. NC-114. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station: 66-76.

Farrish, K.W.; Grigal, D.F.  
1988. Decomposition in an ombrotrophic bog and a minerotrophic fen in Minnesota. *Soil Science*. 145(5): 353-358.

Fox, Glenn.  
1987. Models of resource allocation in public agricultural research: a survey. *Journal of Agricultural Economics*. 38(3): 449-462.

Haines, Donald A.  
1988. A lower atmospheric severity index for wildland fires. *National Weather Digest*. 13(2): 23-27.

Hairston, Anne Bartlett.  
1988. Soil topographic relationships at two forested sites in Minnesota. St. Paul, MN: University of Minnesota. 105 p. Thesis.

Haissig, Bruce E.  
1988. Forest tree biotechnology: unique tools to enhance forest productivity. In: 14th session of the North American Forestry Commission; 1987 October 13-17; Sault Ste. Marie, ON. Joint Rep. 12. Sault Ste. Marie, ON: Great Lakes Forestry Centre and the Food and Agriculture Organization of the United Nations: 1-5, 18-19.

Hansen, Edward A.  
[1988]. Energy plantations in north central United States: status of research and development plantations. In: Heinonen, Jorma; Kainlauri, Eino; Byrne, John; Rich, Daniel; Salminen, Mervi; Seppanen, Olli, eds. International symposium, Energy options for the year 2000: contemporary concepts in technology and policy: Proceedings from the panel on energy systems; 1988 September 14-17; [Newark], [DE]. Newark, DE: University of Delaware, Center for Energy and Urban Policy Research; 1: 1.255-1.259.

Hansen, Mark H.  
1988. Operability of Lake States timber. In: Proceedings, 16th annual hardwood symposium of the Hardwood Research Council: poster session; 1988 May 15-18; Cashiers, NC. Memphis, TN: Hardwood Research Council: 189. Abstract.

Hansen, Mark H.; Hahn, Jerold T.  
1988. Database management provides easy access to forest inventory data. *Northern Journal of Applied Forestry*. 5(1): 8-11.

Hanson, Paul J.; Dixon, Robert K.; Isebrands, J.G.  
1988. Photosynthesis and respiration of northern red oak seedlings. In: Van Sambeek, J.W.; Rink, George; Johnson, Paul S., eds. 3d workshop on seedling physiology and growth problems in oak plantings (abstracts); 1986 February 12-13; Carbondale, IL. Gen. Tech. Rep. NC-121. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station: 4. Abstract.

Hanson, P.J.; Isebrands, J.G.; Dickson, R.E.; Dixon, R.K.  
1988. Ontogenetic patterns of CO<sub>2</sub> exchange of *Quercus rubra* L. leaves during three flushes of shoot growth. I. Median flush leaves. *Forest Science*. 34(1): 55-68.

Hanson, P.J.; Isebrands, J.G.; Dickson, R.E.; Dixon, R.K.  
1988. Ontogenetic patterns of CO<sub>2</sub> exchange of *Quercus rubra* L. leaves during three flushes of shoot growth. II. Insertion gradients of leaf photosynthesis. *Forest Science*. 34(1): 69-76.

Hazenstab, Robert A.; Bowyer, Jim L.; Bradley, Dennis P.; Hoganson, Howard M.

1987. An assessment of productivity and harvesting costs for various forest harvest systems. In: Bradley, Dennis P.; Lothner, David C., comps. Achieving wood energy potentials: evidence in northeastern Minnesota. Gen. Tech. Rep. NC-114. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station: 31-37.

Heywood, John L.

1987. Experience preferences of participants in different types of river recreation groups. *Journal of Leisure Research*. 19(1): 1-12.

Hodges, Donald G.; Harris, Thomas G., Jr.

1988. U.S. forest products research: trends and outlook. *Forest Products Journal*. 38(7/8): 26-32.

Hoganson, Howard M.

1987. Impacts of wood energy use on timber supply in northeastern Minnesota. In: Bradley, Dennis P.; Lothner, David C., comps. Achieving wood energy potentials: evidence in northeastern Minnesota. Gen. Tech. Rep. NC-114. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station: 13-30.

Hoganson, Howard M.; Lothner, David C.; Rubin, Paul A.

1987. Future market uncertainty: a case for short-rotation systems. In: Bradley, Dennis P.; Lothner, David C., comps. Achieving wood energy potentials: evidence in northeastern Minnesota. Gen. Tech. Rep. NC-114. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station: 38-43.

Hutchison, Ray.

1987. Ethnicity and urban recreation: whites, blacks and hispanics in Chicago's public parks. *Journal of Leisure Research*. 19(3): 205-222.

Hutchison, Ray.

1988. A critique of race ethnicity, and social class in recent leisure-recreation research. *Journal of Leisure Research*. 20(1): 10-30.

Isebrands, J.G.; Dickson, R.E.; Hanson, P.J.

1988. A morphological index for studies on oak seedlings. In: Van Sambeek, J.W.; Rink, George; Johnson, Paul S., eds. 3d workshop on seedling physiology and growth problems in oak plantings (abstracts); 1986 February 12-13; Carbondale, IL. Gen. Tech. Rep. NC-121. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station: 3. Abstract.

Isebrands, J.G.; Hanson, P.J.; Dickson, R.E.; Tomlinson, P.T.

1988. Developmental patterns of leaf growth and photosynthesis in *Quercus rubra* L. seedlings. *American Journal of Botany*. 75(6): 123-124. Part 2: Abstracts, Botanical Society of America.

Jones, Pamela E.; McAvoy, Leo H.

1987. An evaluation of a wilderness user education program: a cognitive and behavioral analysis. In: Legg, Michael H., Ph.D., ed. 1987 National interpreters workshop; [1987 November 1-5]; [St. Louis, [MO]. [Nacogdoches], [TX]: [National Interpreters Workshop and the National Association of Interpretation]: 56-63.

Kangas, Roy J.; Matson, Edsel D., inventors; the United States of America as represented by the Secretary of Agriculture, Washington, DC, as signee. 1988. Mechanism for storing, singulating and planting woody cuttings. U.S. patent 4,732,094. March 22. 10 p. Int. Cl.<sup>4</sup> A01C 11/00. U.S. Cl. 111/3.

Kaplan, Rachel; Herbert, Eugene J.

1987. Cultural and sub-cultural comparisons in preferences for natural settings. *Landscape and Urban Planning*. 14: 281-293.

Kaplan, Stephen.

1987. Mental fatigue and the designed environment. In: Harvey, Joan; Henning, Don, eds. Proceedings, Environmental Design Research Association conference: public environments; 1987 May 29-June 2; Ottawa, CA. [Ottawa], [CA]: [Publisher unknown]: 55-60.

Knopf, Richard C.

1987. Human behavior, cognition, and affect in the natural environment. In: Stokols, Daniel; Altman, Irwin, eds. *Handbook of environmental psychology*. New York, NY: John Wiley and Sons: 783-825.

Lichty, Richard W.; Bradley, Dennis; McMillan, David J.

1987. Economic impact of substituting local wood energy for imported fossil fuels. In: Bradley, Dennis P.; Lothner, David C., comps. Achieving wood

energy potentials: evidence in northeastern Minnesota. Gen. Tech. Rep. NC-114. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station: 60-65.

Lieber, Stanley R.; Fesenmaier, Daniel R.; Bristow, Robert S.

1988. Social and environmental characteristics affecting design alternatives for outdoor recreation participation. In: Golledge, Reginald G.; Timmermans, Harry, eds. Behavioral modelling in geography and planning. New York, NY: Croom Helm Ltd.: 272-297.

Lime, David W.

1987. Observing visitors as a method of studying use in information centers: comparisons from a 1973 and 1983 study in Minnesota. In: Legg, Michael H., Ph.D., ed. 1987 National Interpreters workshop; [1987 November 1-5]; [St. Louis], [MO]. [Nacogdoches], [TX]: [National Interpreters Workshop and the National Association of Interpretation]: 70-78.

Lime, David W.

1986. River recreation and natural resource management: a focus on river running and boating. In: A literature review: the President's Commission on Americans outdoors. Washington, DC: U.S. Department of Agriculture, Forest Service: Management 137-Management 150.

Lime, David W.

[1987]. Some future challenges in river recreation planning and management. In: Seguire, Susan, ed. Proceedings, 1st international congress on trail and river recreation, 1986; 1986 May 31-June 4; Vancouver, BC. Vancouver, BC: Outdoor Recreation Council of British Columbia: 188-195.

Lin, Yann-Jou; Peterson, George L.; Rogerson, Peter A.

1988. A nested urban recreation site choice model. *Leisure Science*. 10: 1-15.

Malterer, Thomas J.; [Verry, Elon S.; Ergavec, John].

1988. A comparative analysis of the USDA fiber volume, USSR centrifugation, and von post humification methods for determining fiber content and degree of decomposition (humification). In: Proceedings, 8th international peat congress; 1988 August 14-21; Leningrad, USSR. Bull. 19. Helsinki, FI: Bulletin of the International Peat Society: 129-139.

Mattson, James A.; Christopherson, Nels S.

c1987. Harvesting system developments for biomass plantations. In: Klass, Donald L., ed. Biomass and wastes 10; [1986 April 7-10]; [Washington], [DC]. Chicago, IL: Institute of Gas Technology: 187-204.

McRoberts, Ronald E.

1988. Comparing regression curves. In: Ek, Alan R.; Shifley, Stephen R.; Burk, Thomas E., eds. Forest growth modelling and prediction: proceedings, IUFRO conference; 1987 August 23-27; Minneapolis, MN. Gen. Tech. Rep. NC-120: SAF-87.12. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station; 2: 762-769.

Michael D.A.; Isebrands, J.G.; Dickmann, D.I.; Nelson, N.D.

1988. Growth and development during the establishment year of two *Populus* clones with contrasting morphology and phenology. *Tree Physiology*. 4: 139-152.

Michler, Charles H.

1988. Review of "Plant hormones and their role in plant growth and development." *Forest Science*. 34(2): 537. Book review.

Michler, C.H.; Bauer, E.O.

1988. Somaclonal variants of poplar that tolerate sulfometuron methyl. In: 39th annual meeting: Tissue culture Association; 1988 June 12-15; Las Vegas, NV. In Vitro: Cellular and Developmental Biology. 24(3): Part 2: 52A. Abstract 164.

Michler, C.H.; Haissig, B.E.

1988. Increased herbicide tolerance of *in vitro* selected hybrid poplar. In: Ahuja, M.R., ed. Somatic cell genetics of woody plants: Proceedings, IUFRO working party S2.04-07 somatic cell genetics; 1987 August 10-13; Grosshansdorf, The Federal Republic of Germany. Dordrecht, The Netherlands: Kluwer Academic Publishers: 183-189.

Neuman, Mark C.; Preece, John E.; Gaffney, Gerald; Van Sambeek, J.W.

1988. Production of somatic embryoid-like structures from immature cotyledonary tissue of black walnut (*Juglans nigra* L.). *HortScience*. 23(3): 807. Abstract 632.

Nichols, D.S.  
 1987. Response of clear and colored lakes to acid deposition. In: NADP technical committee meeting abstracts of papers; 1987 November 2-5; Minneapolis, MN. Fort Collins, CO: Colorado State University, NADP/NTN Coordinator's Office: 12. Abstract.

Noh, E.W.; Minocha, S.C.; Riemenschneider, D.E.  
 1988. Adventitious shoot formation from embryonic explants of red pine (*Pinus resinosa*). *Physiologia Plantarum*. 74: 119-124.

Ohmann, Lewis F.  
 [1988]. The relationship between various aspects of forest conditions and atmospheric deposition across the northwestern Minnesota-to-southeastern Michigan deposition gradient. A final report to the program manager, National Vegetative Survey Forest Response Program, USDA, Forest Service. VS-10. Research Triangle Park, NC: National Vegetative Survey.

Ohmann, L.F.; Shifley, S.R.; Holdaway, M.R.; Grigal, D.F.  
 1988. The relationship between forest condition and atmospheric deposition across the northwestern Minnesota to southeastern Michigan deposition gradient. In: Forest response program annual meeting: project status reports; 1988 February 22-26; Corpus Christi, TX. [Raleigh], [NC]: [North Carolina State University, Atmospheric Impacts Research Program]; 2: 370-375.

Ostry, M.E.  
 1988. Application of biotechnology for the development of disease-resistant poplars. In: Lin, D.; Hubbes, M.; Zsuffa, L., comps. Proceedings, IEA/BA task 2 workshop: biotechnology development; 1987 September 1; Uppsala, SE. Inf. Rep. 88:1. Toronto, ON: University of Toronto: 13-27.

Ostry, M.E.; Skilling, D.D.  
 1988. Somatic variation in resistance of *Populus* to *Septoria musiva*. *Plant Disease*. 72(8): 724-727.

Ostry, Michael E.; McRoberts, Ronald E.; Ward, Kathleen T.; Resendez, Robert.  
 1988. Screening hybrid poplars in vitro for resistance to leaf spot caused by *Septoria musiva*. *Plant Disease*. 72(6): 497-499.

Palmer, M.A.; McRoberts, R.E.; Nicholls, T.H.  
 1988. Sources of inoculum of *Sphaeropsis sapinea* in forest tree nurseries. *Phytopathology*. 78(6): 831-835.

Ponder, Felix, Jr.  
 1988. Effects of a nitrification inhibitor and nitrogen fertilizers on white oak establishment. In: Van Sambeek, J.W.; Rink, George; Johnson, Paul S., eds. 3d workshop on seedling physiology and growth problems in oak plantings (abstracts); 1986 February 12-13; Carbondale, IL. Gen. Tech. Rep. NC-121. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station: 13. Abstract.

Ponder, Felix, Jr.; Tadros, Mahasin, G.; Tadros, Shawky, H.  
 1988. Effects of juglone on growth and nodulation of hairy vetch. In: Payne, Jerry A., ed. 78th annual report of the Northern Nut Growers Association; 1987 July 26-29; Lexington, KY. Urbana, IL: Northern Nut Growers Association: 46-50.

Powers, H.R., Jr.; Stone, D.M.  
 1988. Control of tip moth by Carbofuran reduces fusiform rust infection on loblolly pine. Res. Pap. SE-270. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station. 4 p.

Probst, John R.; Rakstad, Donald S.  
 1987. Small mammal communities in three aspen stand-age classes. *Canadian Field-Naturalist*. 101(3): 362-368.

Riemenschneider, D.; Haissig, B.; Michler, C.  
 1988. Genetic effects on adventitious rooting *in vitro* in *Populus deltoides*. In: 39th annual Tissue Culture Association; 1988 June 12-15; Las Vegas, NV. *In Vitro: Cellular and Developmental Biology*. 24(3): Part 2: 52A. Abstract 161.

Riemenschneider, D.E.; Haissig, B.E.; Sellmer, J.; Fillatti, J.J.  
 1988. Expression of an herbicide tolerance gene in young plants of a transgenic hybrid poplar clone. In: Ahuja, M.R., ed. Somatic cell genetics of woody plants: Proceedings, IUFRO working party S2.04-07 somatic cell genetics; 1987 August 10-13; Grosshansdorf, Federal Republic of Germany. Dordrecht, The Netherlands: Kluwer Academic Publishers: 73-80.

Rink, George.

1988. Variation in growth among white oak seedlings in a half-sib progeny test. In: Van Sambeek, J.W.; Rink, George; Johnson, Paul S., eds. 3d workshop on seedling physiology and growth problems in oak plantings (abstracts); 1986 February 12-13; Carbondale, IL. Gen. Tech. Rep. NC-121. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station: 1. Abstract.

Rink, George; Wells, Osborne E.

1988. Productivity comparison of 37-year-old loblolly-shortleaf pine seed sources in southern Illinois. *Northern Journal of Applied Forestry*. 5(2): 155-158.

Rouse, Cary; Paananen, Donna.

1988. A quick method to determine northeastern woody fuel weights. *Fire Management Notes*. 49(2): 23-24.

Russell, Julie A.; McCown, Brent H.

1988. Recovery of plants from leaf protoplasts of hybrid-poplar and aspen clones. *Plant Cell Reports*. 7: 59-62.

Russell, Julie A.; Banaras, Muhammad; McCown, Brent H.

1988. Osmotic microenvironments within tissue culture well plates are an important cause of variability in plant protoplast cultures. *In Vitro: Cellular & Developmental Biology*. 24(6): 605-608.

Schlesinger, Richard C.; Polak, David J.

1988. Estimating acorn production of individual oak trees. In: Van Sambeek, J.W.; Rink, George; Johnson, Paul S., eds. 3d workshop on seedling physiology and growth problems in oak plantings (abstracts); 1986 February 12-13; Carbondale, IL. Gen. Tech. Rep. NC-121. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station: 9. Abstract.

Schroeder, Herbert W.

1987. Dimensions of variation in urban park preference: a psychophysical analysis. *Journal of Environmental Psychology*. 7: 123-141.

Schroeder, Herbert W.

1988. The experience of significant landscapes at the Morton Arboretum. In: *Economic and social development: a role for forest and forestry professionals: Proceedings of the 1987 Society of American Foresters national convention*; 1987 October 18-21; Minneapolis, MN. Bethesda, MD: Society of American Foresters: 378-381.

Scott, Charles, T.; Hahn, Jerold T.; MacLean, Colin D.

1988. Forest inventory and analysis needs for a growth processor. In: Ek, Alan R.; Shifley, Stephen R.; Burk, Thomas E., eds. *Forest growth modelling and prediction: proceedings, IUFRO conference*; 1987 August 23-27; Minneapolis, MN. Gen. Tech. Rep. NC-120: SAF-87.12. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station: 2: 1133-1137.

Seal, Ulysses, S.; Plotka, Edward D.; Mech, David; Packard, Jane M.

1987. Seasonal metabolic and reproductive cycles in wolves. In: Frank, H., ed. *Man and wolf*. Dordrecht, The Netherlands: Dr W. Junk Publishers: 109-125.

Shelby, Bo; Lime, David W.

1986. Whitewater river recreation. In: *A literature review: the President's Commission on Americans outdoors*. Washington, DC: U.S. Department of Agriculture, Forest Service: Activities 91-Activities 97.

Shetron, Stephen G.; Sturos, John A.; Padley, Eunice; Trettin, Carl.

1988. Forest soil compaction: effect of multiple passes and loadings on wheel track surface soil bulk density. *Northern Journal of Applied Forestry*. 5(2): 120-123.

Steklenski, Philip G.; Haygreen, John G.

1987. Engineering and economic considerations of wood energy systems using wood chips and pellets. In: Bradley, Dennis P.; Lothner, David C., comps. *Achieving wood energy potentials: evidence in northeastern Minnesota*. Gen. Tech. Rep. NC-114. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station: 77-82.

Talbot, Janet Frey; Bardwell, Lisa V.; Kaplan, Rachel.

1987. The functions of urban nature: uses and values of different types of urban nature settings. *Journal of Architectural and Planning Research*. 4(1): 47-63.

Thompson, Michael A.  
 1988. Optimizing spur road spacing on the basis of profit potential. *Forest Products Journal*. 38(5): 53-57.

Thompson, Michael A.; Sturos, John A.  
 1988. Status of the Lake States forests. In: *High technology in forest engineering: Proceedings, Council on forest engineering 10th annual meeting; 1987 August 3-6; Syracuse, NY. [Syracuse], [NY]: [State University of New York, College of Environmental Sciences and Forestry]*: 9-14.

Van Sambeek, J.W.  
 1988. In vitro micropropagation of white oak. In: *Van Sambeek, J.W.; Rink, George; Johnson, Paul S., eds. 3d workshop on seedling physiology and growth problems in oak plantings (abstracts); 1986 February 12-13; Carbondale, IL. Gen. Tech. Rep. NC-121. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station*: 7. Abstract.

Van Sambeek, J.W.; Rink, George; Johnson, Paul S., eds.  
 1988. 3d workshop on seedling physiology and growth problems in oak plantings (abstracts); 1986 February 12-13; Carbondale, IL. Gen. Tech. Rep. NC-121. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 19 p.

Vasievich, J. Michael; Kowalski, David G.; Hobrla, Sharon L.  
 1988. FORSight: the timber price analysis system (version 1.0). [Florence], [AL]: [Forest Resources Systems Institute]. 146 p.

Verry, E.S.; Nodop, K.  
 1987. Do weekly collections maintain basic ionic relationships? In: *NADP technical committee meeting abstracts of papers; 1987 November 2-5; Minneapolis, MN. Fort Collins, CO: Colorado State University, NADP/NTN Coordinator's Office*: 10. Abstract.

Verry, E.S.; Brooks, K.N.; Barten, P.K.  
 1988. Streamflow response from an ombrotrophic mire. In: *Proceedings of the international symposium on the hydrology of wetlands in temperate and cold regions; 1988 June 6-8; Joensuu, Fl. Helsinki, Fl: Publication of the Academy of Finland*: 52-59.

Vining, Joanne; Schroeder, Herbert W.  
 1987. Emotions in environmental decision making: rational planning versus the passionate public. In: *Milles, Marc T.; Gale, Richard P.; Brown, Perry J., eds. Social science in natural resource management systems. Boulder, CO: Westview Press*: 181-192.

Widmann, Richard H.; Blyth, James E.  
 1988. Pulpwood production in 1986: record level reached; big gain in roundwood. *The Northern Logger and Timber Processor*. 36(8): 20-21.

Woodward, Michael D.  
 1988. The effects of social class on voluntary association membership among urban Afro-Americans. *Sociological Focus*. 21(1): 67-80.

Woodward, Michael D.  
 1986. Voluntary association membership among Black Americans: the post-civil rights era. *Sociological Quarterly*. 28(2): 285-301.







